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DESCRIPTIVE NOTES FOR NINE SPECIES OF *HETEROMURUS* (S.G. *HETEROMURTRELLA*) AND A KEY TO THE SPECIES (COLLEMBOLA: ENTOMOBRYIDAE)[1]

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The subgenus *Heteromurtrella* was erected by Mari Mutt (1979a) for the 12 tropical species of *Heteromurus* not belonging in *Alloscopus* Börner 1903 (reviewed by Mari Mutt (1978a)), the only other tropical subgenus. The description of *Heteromurtrella* was supplemented with descriptions of two new species (*barrai* and *puertoricensis*), by a map detailing the geographic distribution of all the species, and by a key to the subgenera of *Heteromurus*.

The present contribution completes a revision of *Heteromurtrella* through a key to the species and addition to the descriptions of nine species.

Throughout this paper I have used a series of abbreviations to indicate the repository of specimens. These are as follows: BMNH—British Museum (Natural History), Department of Entomology, Cromwell Rd., London SW7 5BD, England; FMNH—Field Museum of Natural History, Roosevelt Rd. and Lake Shore Drive, Chicago, Illinois 60605; INHS—Illinois Natural History Survey, Division of Faunistics Surveys, Natural Resources Bldg., Urbana, Illinois 61801; JAB—J. A. Barra collection, Institut de Zoologie, 12 rue de l'Université, 67000 Strasbourg, France; JAMM—J. A. Mari Mutt collection, Department of Biology, University of Puerto Rico, Mayagüez, Puerto Rico 00708; MCZ—Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts 02138; MNHN—Museum National d'Histoire Naturelle, Ecologie Générale, 4 Avenue du Petit Chateau, 91—Brunoy, France; NZNM—New Zealand National Museum, Private Bag, Wellington, New Zealand; RY—R. Yosii collection, Department of Biology, Yoshida College, Kyoto University, Kyoto Japan.

Key to Species

1. Eyes 6 + 6 ..... *abruptus*
   Eyes 2 + 2 or 1 + 1 2
2. Head and body deeply pigmented throughout 3
   Pigment absent, restricted to eye patch, restricted to anterior portion of head and to antennae or if diffused throughout head and body (*stannardi*) it is very light and visible only under magnification 4

3. Ungues relatively short, basally wide, bidentate (Salmon, 1954:126, fig. 8); Uganda ..... *lividus*
   Ungues long, basally slender, tridentate (Fig. 23; Denis, 1931:144, figs. 148–150); Costa Rica ..... *diommatus*
4. Abd. 1 with 1 or 2 machrochaetae per side 5
   Abd. 1 with 3 macrochaetae per side 7
5. Three P macrochaetae present[2] (Mari Mutt, 1977:327, fig. 1); body macrochaetotaxy as in Mari Mutt, 1977:327, fig. 2; labral papillae of type III (Fig. 3); very diffuse pigment on antennae, head, body and coxae (pigment visible only under high magnification); unguiculus without tooth on inner margin; mucro without basal spine; Solomon Islands (Guadalcanal) ..... *stannardi*
   One P macrochaeta present (Fig. 9); body macrochaetotaxy as in Figures 10 or 19; labral papillae of type II (Fig. 1); fairly concentrated pigment restricted to anterior portion of head and to antennae; unguiculus with inner tooth; mucro with basal spine 6
6. Abd. 1 with 1 macrochaeta per side; outer pair of macrochaetae of Th. 3 close together (Fig. 10); Gabon ..... *mirificus*
   Abd. 1 with 2 macrochaetae per side; outer pair of macrochaetae of Th. 3 farther apart (Fig. 19); Uganda ..... *similis*
7. Th. 2 with 4 inner posterior setae (Fig. 17) 8
   Th. 2 with 2 or 3 inner posterior setae (Figs. 10, 16, 18, 19) 9
8. Th. 3 with 7 macrochaetae per side (Yosii, 1964:15, fig. 6h); labral papillae of type III (Yosii, 1964:15, fig. 6a): eyes 1 + 1; Tonga Islands (Eua) ..... *nitens*
   Th. 3 with 6 macrochaetae per side (Fig. 17); labral papillae of type II (Fig. 2); Eyes 2 + 2; Costa Rica, Guatemala, Peru ..... *schoetti*
9. Th. 2 with 2 inner posterior setae (Mari Mutt, 1979a:fig. 7); 2 P macrochaetae present (Mari Mutt, 1979a:fig. 2); unguiculus with inner toothlike projection; Gabon ..... *barrai*
   Th. 2 with 3 inner posterior setae (Figs. 16, 18); 3 P macrochaetae present (e.g. Figs. 5, 8); unguiculus without inner toothlike projection 10
10. Eyes not surrounded by pigment; mucro without basal spine; Gabon ..... *subdubius*
    Eyes surrounded by pigment; mucro with basal spine 11
11. Tibiotarsi with inner row of smooth (very finely striated) setae (Barra, 1968:111, fig. 4); differentiated seta of outer labial papilla reaching apex of its papilla (Fig. 15); Ivory Coast ..... *dubius*
    All tibiotarsal setae conspicuously ciliated; differentiated seta of outer labial papilla typical, not reaching apex of its papilla (Mari Mutt, 1979a:fig. 15); Puerto Rico ..... *puertoricensis*

Heteromurus (*Heteromurtrella*) *stannardi* Mari Mutt

Heteromurus stannardi Mari Mutt, 1977:326–329. Mari Mutt, 1978a:242. Mari Mutt, 1978b:5.

Apex of Ant. 5 without pin seta but with 1 or 2 unusually long, apically spatulated setae (Fig. 20, 21). Eyes (2 + 2) surrounded by dark pigment. Labral papillae of type III (Fig. 3); middle pair large, placed close together, lateral pair rounded in dorsal view. Labial chaetotaxy as in Fig. 13. Setae of maxillary palp typical of subgenus (e.g. Fig. 12). Differentiated seta of outer labial papilla not reaching apex of its papilla (Fig. 14). Inner unguicular lamellae toothless. Abd. 2 with a second macrochaeta (omitted in original description) placed in the same position as in other members of subgenus (e.g. Figs. 10, 16). Dorsum of manubrium with 3 pairs of smooth erect setae; proximal dorsal portion of dentes with a pair of these setae.

Diagnosis.—The species is closest to *H. nitens* and *subdubius*. From the first it may be separated by the color pattern, claw structure, number eyes (1 + 1 in *nitens*, 2 + 2 in *stannardi*), chaetotaxy of Th.2-Abd. 1, and by lack of periocellar pigmentation in *nitens*. From *subdubius* it may be separated by the color pattern, claw structure, chaetotaxy of Abds. 1–4, absence of periocellar pigmentation in *subdubius*, and by the type of labral papillae (II in *subdubius*, III in *stannardi*).

Material examined and distribution.—INHS. Solomon Islands, Guadalcanal, Mt. Popamanasiu, 1320 m, Nov. 1–4, 1965, mossy ridge forest litter, P. N. Lawrence, col., Royal Society Expedition, B. M. 1966—1, 3 paratypes. The holotype and additional paratypes are at the BMNH.

The species is known from a single locality in the Solomon Islands.

Heteromurus (*Heteromurtrella*) *mirificus* (Salmon)

Ptenura mirifica Salmon, 1954:125–127. Salmon, 1964:480.
Heteromurus mirificus (Salmon). Barra, 1968:107, 114–116, 117 (misidentification, specimens described as a new species by Mari Mutt, 1979a).

Habitus as in Figure 27. Length up to 1.7 mm. Pigment restricted to antennae and anterior half of head. Pin seta not seen but apex of Ant. 5 with a conspicuous apically knobbed seta. Eyes 2 + 2 on dark patch. Head macrochaetotaxy as in Figure 9. Labral papillae of type II (Fig. 1), large, strongly hooked and apically pointed, not as type II of *schoetti* (see Fig. 2), shorter than in *barrai*. Labial chaetotaxy, setae of maxillary palp, and differentiated seta of outer labial papilla typical of subgenus. Body macrochaetotaxy as in Figure 10. Tibiotarsi without smooth setae. Structure of claws as in Figure 24, inner margin of unguiculus with conspicuous tooth.

No smooth setae seen on furcula but this may be due to condition of specimens. Mucro with basal spine.

Diagnosis.—The species is most similar to *H. similis* from which it may be separated by the chaetotaxy of Abd. 1 (2 setae in *mirificus*, 1 in *similis*), and by the relative position of the outer pair of macrochaetae of Th. 3 (Figs. 10, 19).

Material examined and distribution.—BMNH, Uganda, Ruwenzori, Mt. Baker, about 4340 m, in soil sample R3, Feb. 2, 1949, G. Salt, col., 1 paratype (J. T. Salmon colln., 3788, 1953—388). MCZ. Ruwenzori, above Lake Bujuka, under moss on stone, about 4000 m, Jan. 31, 1949, G. Salt, col., 2 paratypes (J. T. Salmon colln., 2598–9, 29423). The holotype (not seen) is at the BMNH.

The species is known only from Uganda.

Heteromurus (*Heteromurtrella*) *similis* Barra

Heteromurus similis Barra, 1968:105–107, 112–114, 117.

This species is very similar to *H. mirificus* (*sensu* Salmon, 1954, *nec.* Barra, 1968); the only difference I can find is the chaetotaxy of Th. 3-Abd. 2 (Figs. 10, 19). Both species are similar in all other characteristics listed under *mirificus*. Habitus as in Figure 28, manubrium dorsally with smooth setae.

Material examined and distribution.—JAB. Gabon, Plateau-Ipassa, IPA 5E, 17, June 7, 1956, in soil 0–5 cm, J. A. Barra, col., holotype and 1 paratype. As preceding but IPA 3, fruit B, May 15, 1966, fruit B of *Strophantus sarmentosus* lying on soil, 1 paratype. As preceding but IPA 6, Cl. 3, June 11, 1966, on burned area, 1 paratype.

The species is known only from Gabon.

Heteromurus (*Heteromurtrella*) *nitens* Yosii

Heteromurus nitens Yosii, 1964:14–16. Barra, 1968:106, 110. Mari Mutt, 1977:326.

The type material of this species is in the author's collection (RY) and has not been available for study.

Judging from the original description, the species appears closest to *H. stannardi* and *subdubius*. From the former it may be separated by a series

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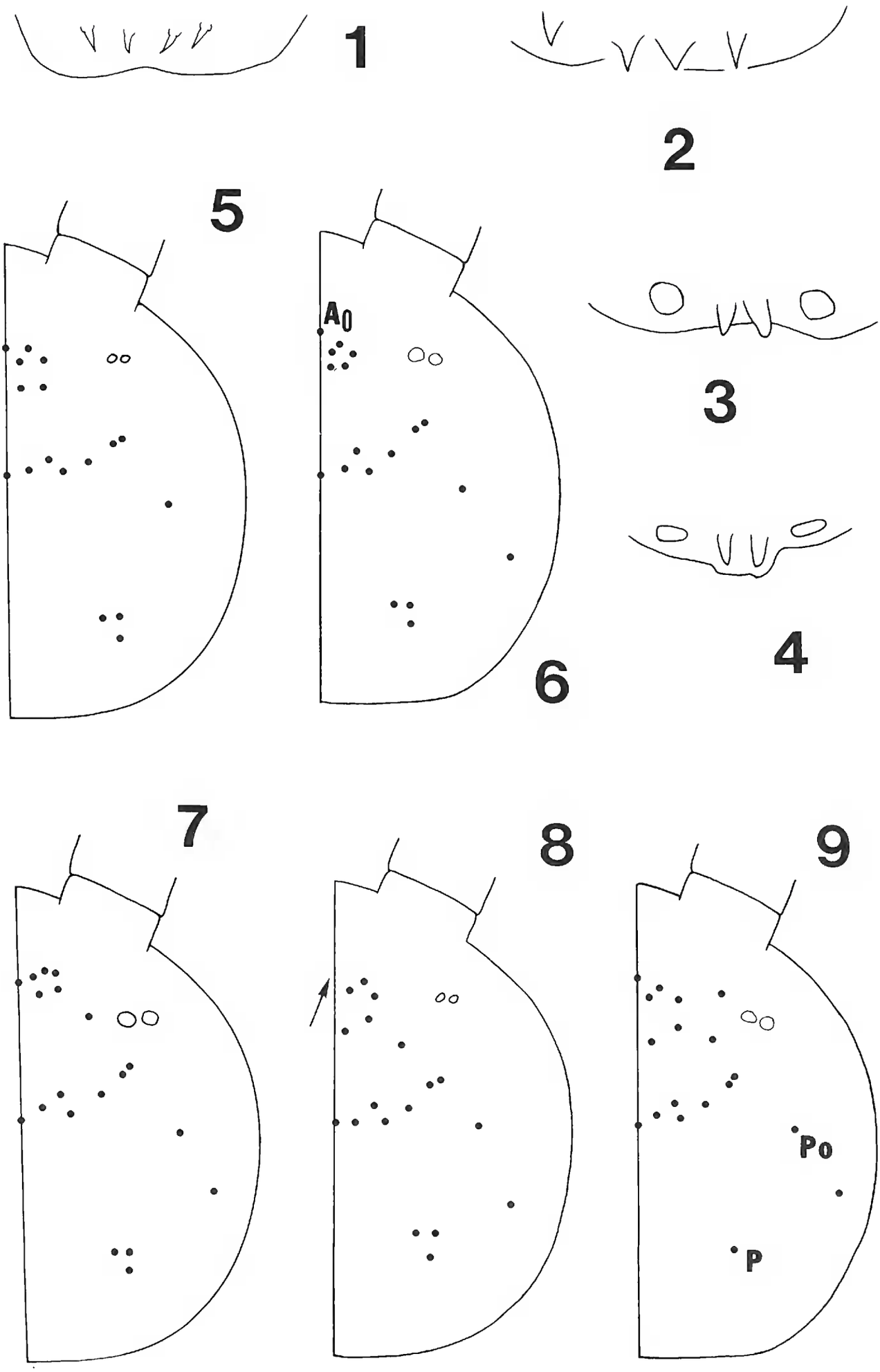
Figs. 1–9. Figs. 1–4. Labral papillae. 1. *Heteromurus* (*Heteromurtrella*) *mirificus*. 2. *H.* (*H.*) *schoetti*. 3. *H.* (*H.*) *stannardi*. 4. *H.* (*H.*) *diommatus*. Figs. 5–9. Head macrochaetotaxy, each dot represents one seta. 5. *H.* (*H.*) *dubius*. 6. *H.* (*H.*) *schoetti*. 7. *H.* (*H.*) *diommatus*. 8. *H.* (*H.*) *subdubius*. 9. *H.* (*H.*) *mirificus*.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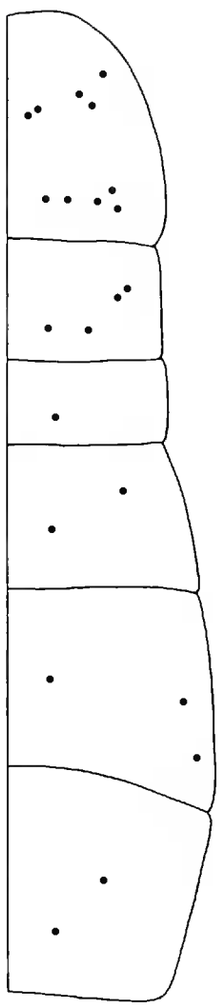
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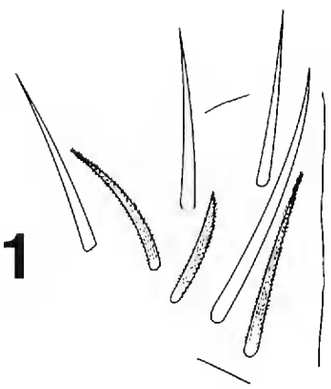
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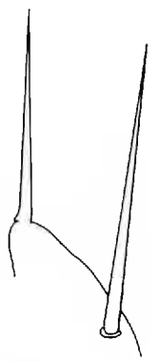
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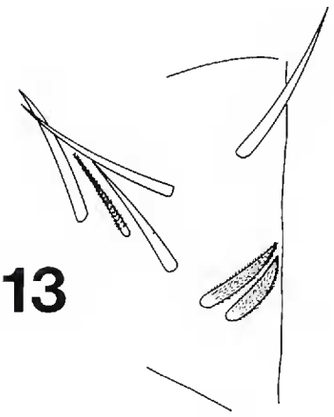
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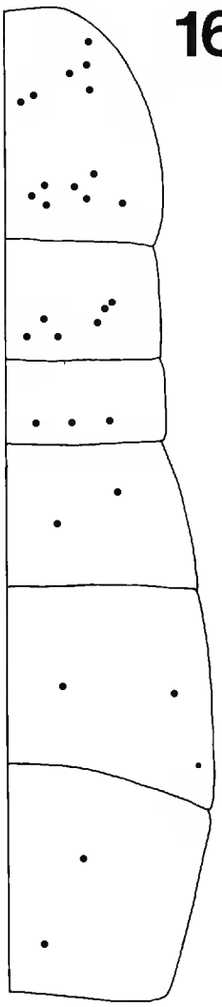
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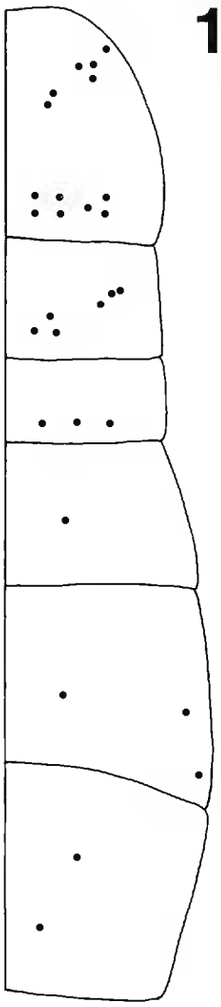
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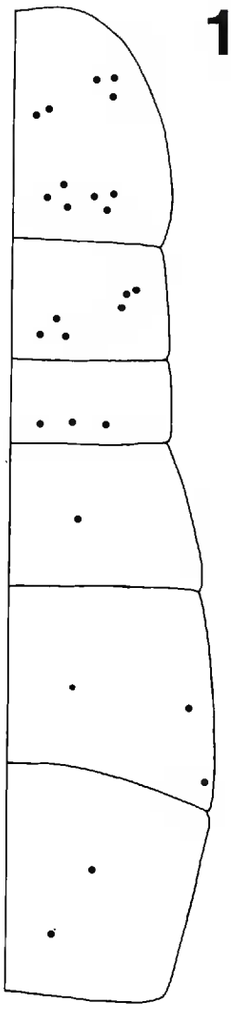
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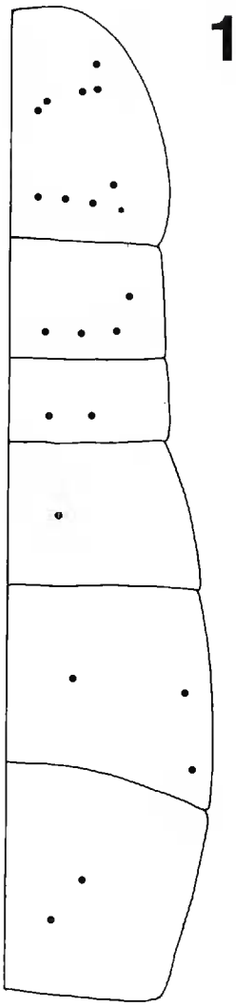
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of characters listed in that species' diagnosis. From *subdubius* it may be separated by the color pattern, claw structure, chaetotaxy of Th. 2 & Abd. 1, and by the type of labral papillae (II in *subdubius,* III in *nitens*).

The species is known only from its type locality in the Tonga Islands (Eua).

Heteromurus (*Heteromurtrella*) *schoetti* Denis

Heteromurus schoetti Denis, 1931:145, 146, 164. Denis, 1933:254–255. Barra 1968:105, 107.
Ptenura schoetti (Denis). Salmon, 1964:483.
Heteromurus (*Heteromurus*) *schoetti* Denis. Mari Mutt, 1978a:244.
Heteromurus bidentatus Denis, 1931:146, 147, 164. Denis, 1933:255. Yosii, 1964:16. Barra, 1968:105, 107. NEW SYNONYMY.
Ptenura bidentata (Denis). Salmon, 1964:478.

Habitus as in Figure 30. Length up to 2.0 mm (type material up to 1.5 mm). Completely devoid of pigment. Apex of Ant. 5 without pin seta but with a long, apically knobbed seta (Fig. 22). Eyes 2 + 2, not surrounded by pigment. Head macrochaetotaxy as in Figure 6. Labral papillae of type II (Fig. 2), all strongly conelike, straight, not as type II of *mirificus* (see Fig. 1). Labial chaetotaxy (Fig. 11), setae of maxillary palp (Fig. 12), and differentiated seta of outer labial papilla typical of subgenus. Tibiotarsi without smooth setae. Ungues bi-, tri-, or quadridentate (Figs. 25, 26). Unguiculus without inner tooth. Body macrochaetotaxy as in Figure 17. Dorsum of manubrium with 4 pairs of smooth setae arranged in 2 longitudinal rows; 1 pair of these setae also on dorsal proximal portion of dentes. Mucro with or without basal spine (see comments).

Diagnosis.—The species is close to *H. puertoricensis* and *nitens*. From the first it may be separated by the chaetotaxy of Th. 2 (with 7 posterior setae in *schoetti* (Fig. 17), with 6 posterior setae in *puertoricensis,* see Mari Mutt, 1979a: fig. 6), and by the type of labral papillae (II in *schoetti,* III in *puertoricensis*). Denis' species may be separated from *nitens* by the chaetotaxy of Th. 3, type of labral papillae (II in *schoetti,* III in *nitens*), and by the number of eyes (2 + 2 in *schoetti,* 1 + 1 in *nitens*).

Comments.—The three specimens from Guatemala (see material exam-

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Figs. 10–19. Fig. 10. *H.* (*H.*) *mirificus*—body macrochaetotaxy. Fig. 11. *H.* (*H.*) *schoetti*—chaetotaxy of labial triangle. Fig. 12. *H.* (*H.*) *schoetti*—maxillary palp. Fig. 13. *H.* (*H.*) *stannardi*—chaetotaxy of labial triangle. Figs. 14–15. Differentiated seta of outer labial papilla. 14. *H.* (*H.*) *stannardi.* 15. *H.* (*H.*) *dubius.* Figs. 16–19. Body macrochaetotaxy. 16. *H.* (*H.*) *subdubius.* 17. *H.* (*H.*) *schoetti.* 18. *H.* (*H.*) *dubius.* 19. *H.* (*H.*) *similis.*

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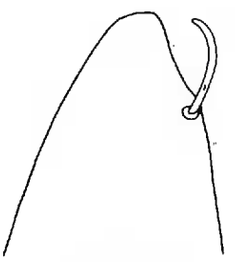

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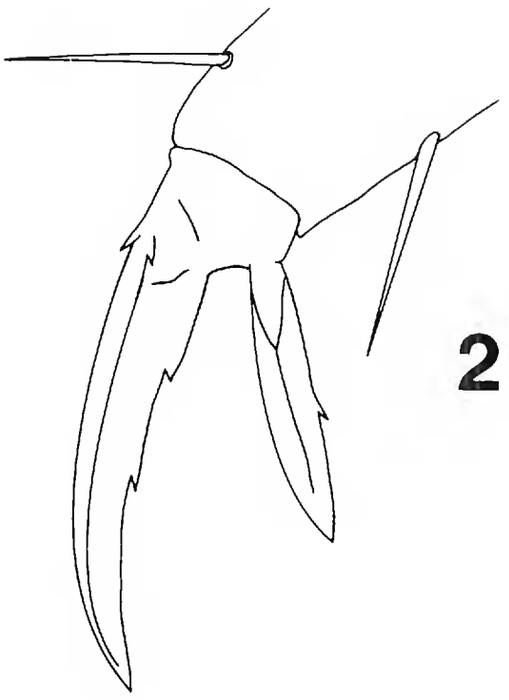

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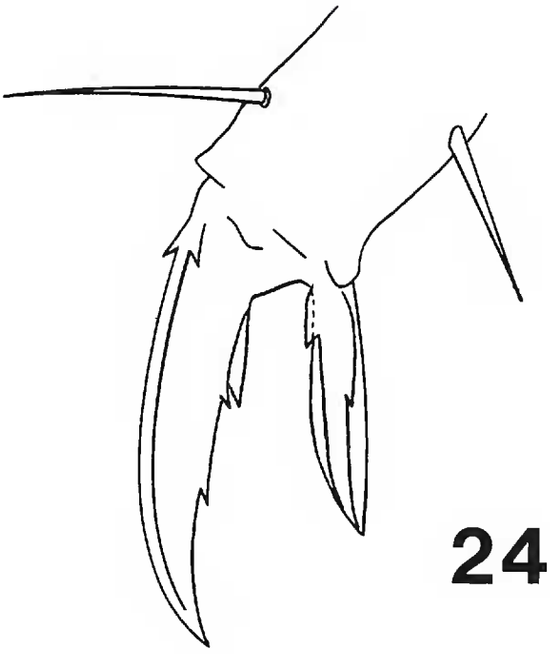

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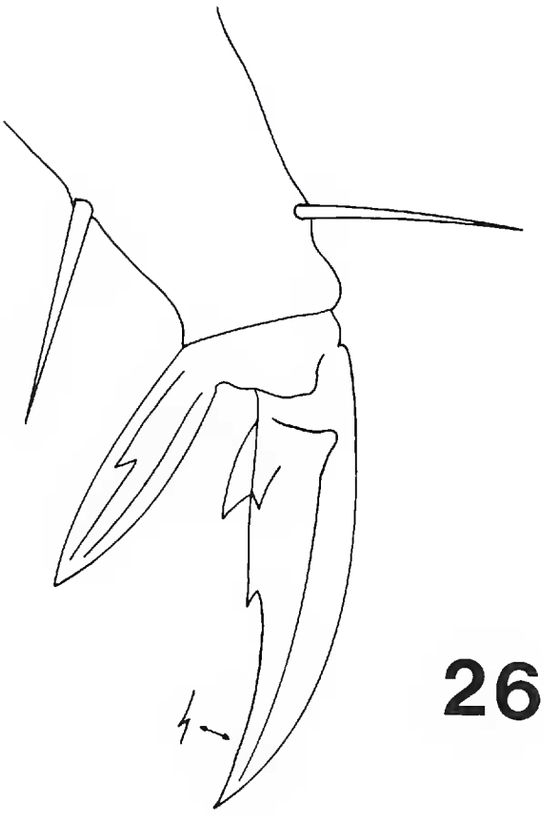

26

ined) differ in two ways from those of Costa Rica. The largest Guatemalan specimen is about 2.0 mm long while none of the Costa Rican specimens exceed 1.5 mm. No trace of mucronal spine is found in the Guatemalan specimens, the site where the base of the spine should be is occupied by a conspicuous depression. The basal spine seems absent in one of the mucrones of two Costa Rican specimens. Both Peruvian specimens possess the basal spine.

The condition of preservation of the Costa Rican material did not allow the comparison of many characters between both groups of specimens but for those that could be studied both groups are identical. The four inner macrochaetae of Th. 2 are clearly visible in the Costa Rican specimens.

One of the front ungues of one Guatemalan specimen is clearly bidentate and based on this I regard *bidentatus* as a junior synonym of *schoetti*. Specimens of both taxa have been collected together (Denis, 1931:147).

Material examined and distribution.—MNHN. Costa Rica, Orizuaco (spelled Orijuco in label), Mat. Silvestri 1930, T:2, 4 syntypes (slide D-0007). San Jose, Mat. Silvestri 1930, T:16, 1 syntype (slide D-0009). La Carpintería, C.R. 32, No. 12, March 1931, 1 specimen (slide D-0008). La Palma, C.R. 32, July 1931, 1 specimen (as *H. bidentatus,* slide D-0006). FMNH. Guatemala, Finca San Rafael, Sacatepaquez, 2300 m, June 30, 1948, leaf mold, R. D. Mitchell, col., Field Museum of Natural History Guatemala Expedition, 2 specimens. INHS. 1 specimen from preceding locality. JAMM. Peru, surroundings of Tingo Maria, Monzon-Tal, banana plantation, 800 m, Dec. 14, 1956, C. Winter, col., 2 specimens (identified as *H. nitidus* (Templeton) by Winter 1963:509, collection 34a).

The species is known from Costa Rica, Guatemala and Peru.

Heteromurus (*Heteromurtrella*) *subdubius* Barra

Heteromurus subdubius Barra, 1968:105, 106, 108–110, 112, 117. Mari Mutt, 1977:326 (misspelled *subduvius*).

Habitus as in Figure 29. Completely unpigmented. Pin seta and apically knobbed seta of Ant. 5 present. Eyes 2 + 2, not surrounded by pigment. Head macrochaetotaxy as in Figure 8, Ao absent. Labral papillae of type III, as in *diommatus* (Fig. 4). Tibiotarsi without smooth setae. Ungues tri-,

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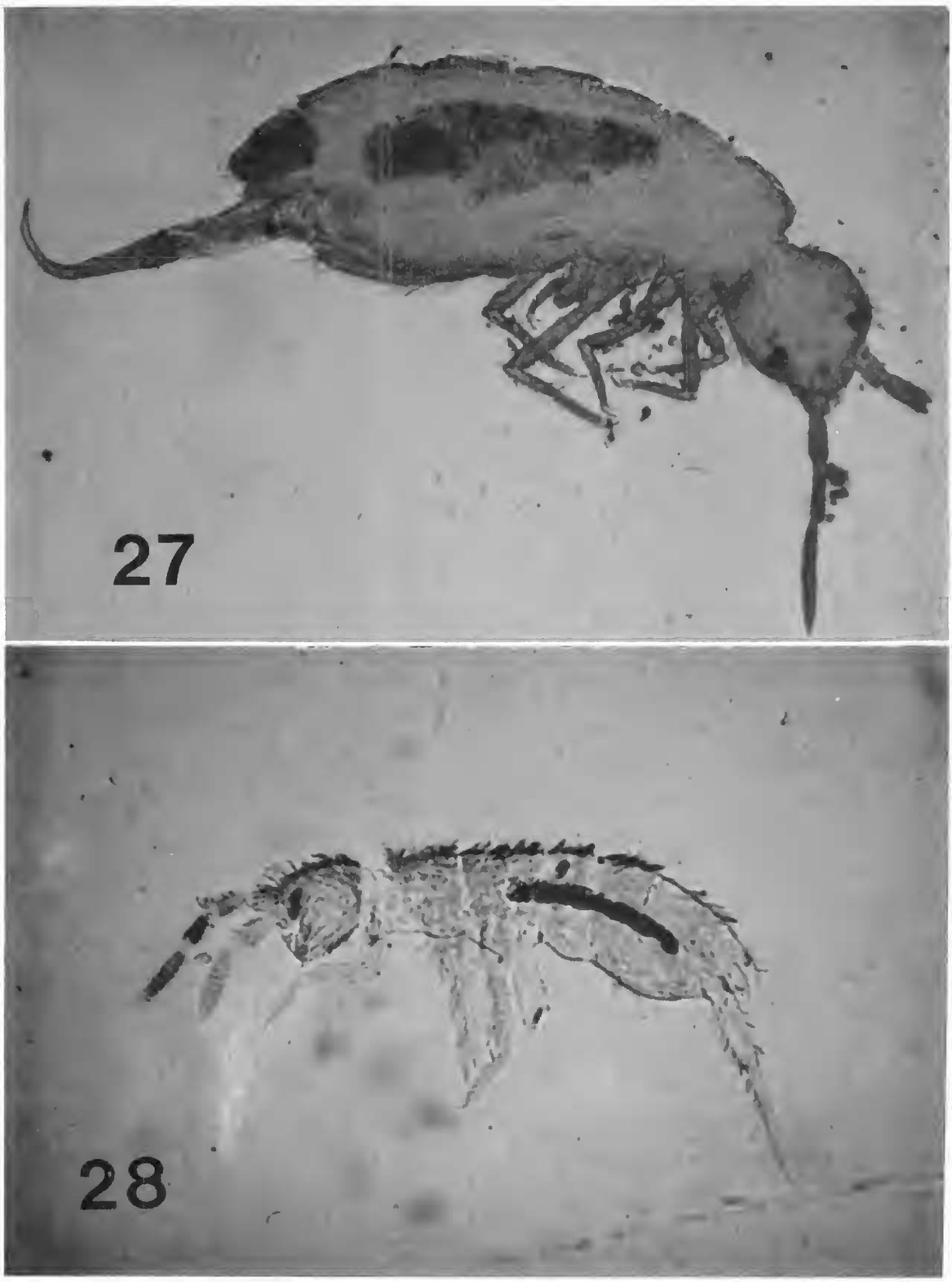
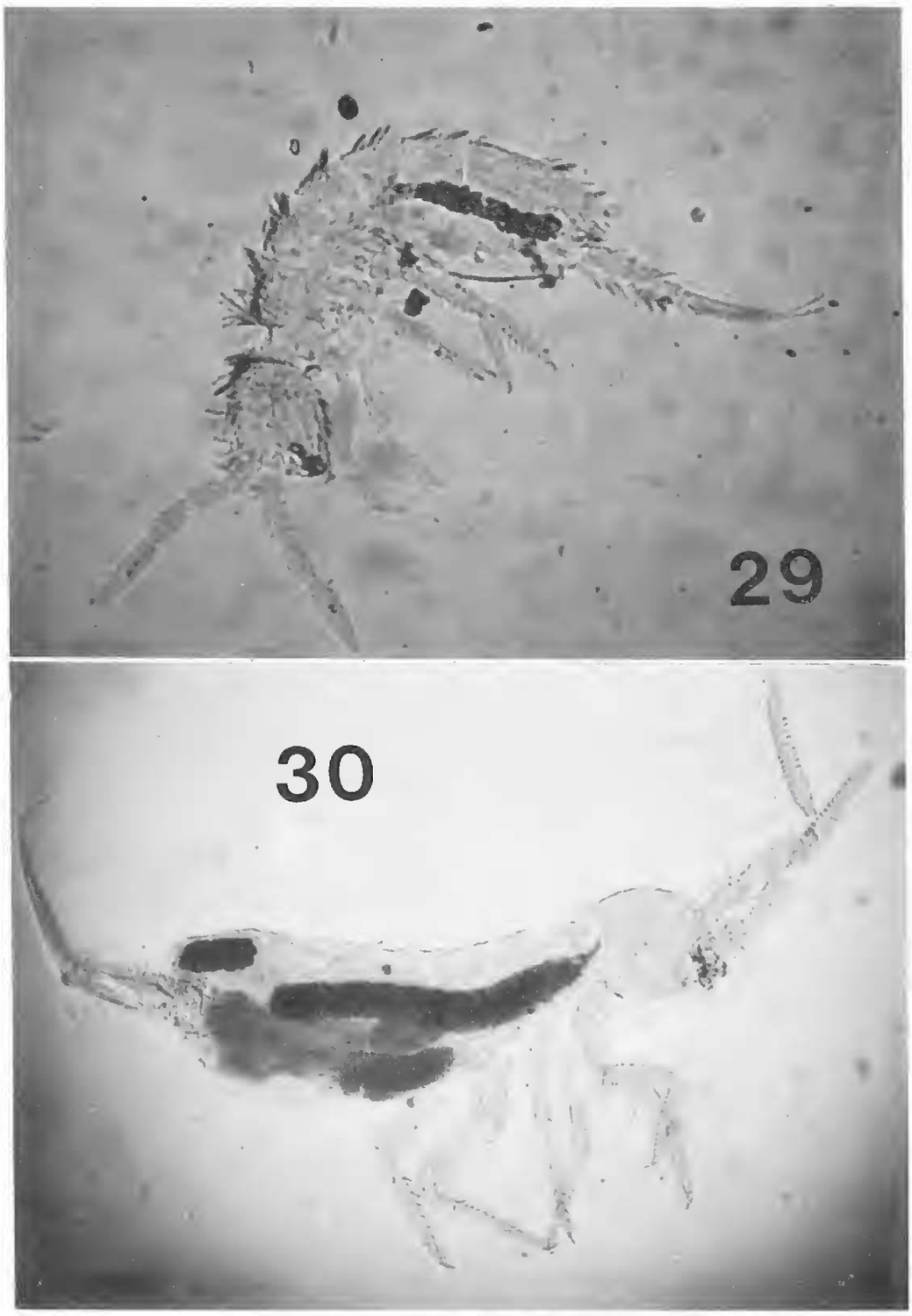
Figs. 20–26. Figs. 20–22. Apex of Ant. 5. 20, 21. *H.* (*H.*) *stannardi*. 22. *H.* (*H.*) *schoetti*. Figs. 23–26. Metathoracic claws. 23. *H.* (*H.*) *diommatus*. 24. *H.* (*H.*) *mirificus* 25, 26. *H.* (*H.*) *schoetti* from Guatemala.



Figs. 27–28. Habitus. 27. *H.* (*H.*) *mirificus*—paratype deposited at the MCZ. 28. *H.* (*H.*) *similis*—holotype.

or quadridentate. Unguiculus without tooth on inner margin. Body macrochaetotaxy as in Figure 16. Dorsum of manubrium and proximal dorsal portion of dentes with smooth setae. Mucro with basal spine.

Diagnosis.—The species is closest to *H. dubius* and *puertoricensis*. It



Figs. 29–30. Habitus. 29. *H.* (*H.*) *subdubius*—holotype. 30. *H.* (*H.*) *schoetti*—specimen from Guatemala.

may be separated from both by the absence of periocellar pigmentation and mucronal spine in *subdubius*.

Material examined and distribution.—JAB. Gabon, Plateau-Ipassa, IPA 8 AVTC 5, June 23, 1966, in leaf litter, J. A. Barra, col., holotype. As preceding but IPA 6 Cig, June 11, 1966, 2 paratypes.

The species is known only from Gabon (Plateau-Ipassa).

Heteromurus (*Heteromurtrella*) *dubius* Delamare Deboutteville

Heteromurus dubius Delamare Deboutteville, in Delamare Deboutteville & Paulian, 1952:68. Delamare Deboutteville, 1951a:54, 67. Delamare Deboutteville, 1951b:271. Barra, 1968:105, 106, 108, 110–112, 117. Mari Mutt, 1978a:242.
Ptenura dubius (Delamare Deboutteville). Salmon, 1964:479.

Length up to 1.2 mm. Pigment restricted to eye patch. Apex of Ant. 5 with knobbed seta. Eyes 2 + 2. Head macrochaetotaxy as in Figure 5. Labral papillae of type III, as in *diommatus* (Fig. 4). Labial chaetotaxy and setae of maxillary palp typical of subgenus. Differentiated seta of outer labial papilla as in Figure 15, reaching apex of its papilla. Tibiotarsi with an inner row of smooth (finely striated) setae (see Barra, 1968:111, Fig. 4). Ungues tri- or quadridentate. Unguiculus without tooth on inner margin. Body macrochaetotaxy as in Figure 18. Dorsum of manubrium with four pairs of smooth erect setae arranged in two longitudinal rows. Mucro with basal spine.

Diagnosis.—The species is closest to *H. subdubius* and *puertoricensis*. It may be distinguished from the first by the presence of periocellar pigmentation in *dubius*, absence of the mucronal spine in *subdubius*, and by the tibiotarsal chaetotaxy. From *puertoricensis* it may be separated by the tibiotarsal chaetotaxy (absence of smooth setae in *puertoricensis*) and by the length of the differentiated seta of the outer labial papilla in relation to the length of its papilla.

Material examined (collected by C. Delamare Deboutteville and R. Paulian) *and distribution*.—Ivory Coast, Lo Banco, × 44, Aug. 17, 1945 (type locality), 23 paratypes. As preceding but H 9, July 27, 1946, 5 specimens. As preceding but T 22, Aug. 3, 1945, 2 specimens. The holotype (not seen) is at the MNHN.

The species is known only from Ivory Coast (Lo Banco).

Heteromurus (*Heteromurtrella*) *abruptus* (Salmon)

Ptenura abrupta Salmon, 1951:137–138. Salmon, 1964:478.
Heteromurus abruptus (Salmon). Mari Mutt, 1979a:214.

The number and shape of the eyes (6 + 6, 3 large and 3 small—see Salmon, 1951:137, Fig. 32) serves to separate this species from all other *Heteromurus*. It is placed in *Heteromurtrella* based only on geographic distribution.

The paraptype at hand measures 0.85 mm (original description states up to 0.65 mm) but otherwise agrees with Salmon's description, including that of the number and arrangement of the eyes. Its condition did not allow the

study of chaetotaxy or other characters recently introduced in the taxonomy of the genus.

Material examined and distribution.—BMNH. Singapore, catchment area jungle, in leaf mold, Sept. 1949, M. W. F. Tweedie, col., 1 paratype mounted in polyvinyl alcohol mounting medium, J. T. Salmon colln., no. 65. The holotype (not seen) and other paratypes are at the BMNH.

The species is known only from the type locality in Singapore.

Heteromurus (*Heteromurtrella*) *lividus* (Salmon).

Ptenura livida Salmon, 1954:125, 126. Salmon, 1964:479.
Heteromurus lividus (Salmon). Mari Mutt, 1979a:214.

The material at hand is in poor condition and only a few details can be added to Salmon's description: At least a pair of macrochaetae on posterior portion of head and at least 1 on Abd. 1. Tibiotarsi devoid of smooth setae with exception of opposite seta to tenent hair on metathoracic legs. Ungues bidentate, inner lamellae on which teeth are placed do not continue down inner margin of ungues as shown by Salmon (p. 126, Fig. 8) but end at base of teeth as in *stannardi* (see Mari Mutt, 1977:329, Fig. 6). Unguiculi quadrilamellate, not trilamellate as stated in original description. Outer tooth of unguiculus large. Tenent hair lanceolate. Dorsum of manubrium with at least 1 smooth seta. Number of eyes and distribution of pigment as stated by Salmon.

Material examined and distribution.—NZNM. Uganda, Ruwenzori, Mt. Baker, about 4620 m, in soil sample, Jan. 26, 1949, G. Salt, col., 3 paratypes (2 without head), J. T. Salmon colln., slides no. 329 and 330. The holotype (not seen) is at the BMNH.

The species is known only from the type locality in Uganda.

Heteromurus (*Heteromurtrella*) *diommatus* Denis

Heteromurus diommatus Denis, 1931:143–145, 164. Mari Mutt, 1978a:242.
Ptenura diommata (Denis). Salmon, 1964:479.

Although 3 specimens are at hand, their condition did not allow a detailed study. Eyes 2 + 2 on a large dark patch. Labral papillae of type III (Fig. 4). Smooth setae present along both sides of median cleft of venter of head. Head macrochaetotaxy as in Figure 7. Tibiotarsi without smooth setae. Claw structure as in Figure 23. Dorsum of manubrium with smooth setae.

Diagnosis.—On account of its pigmentation, 2 + 2 eyes on a dark patch, and claw structure; the species may be separated with some confidence from all other *Heteromurus*. It appears closest to *H. lividus* but differs from it by its claw structure (see key).

Material examined and distribution.—MNHN. Costa Rica, Nov. 1928, mat. Silvestri, 1030 T. 3, 3 specimens on slides D-0010, 0011, 0012.

Although these specimens are not labeled as type material, they are part of the type series and should be regarded as syntypes (article 73c of the International Code of Zoological Nomenclature). The specimen on slide D-0010 is probably the one on which Denis based his figure 147 (p. 144).

The species is known only from the type locality in Costa Rica.

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Footnotes

[1] This article is based, in part, on a thesis deposited by the author in the Graduate College of the University of Illinois at Urbana-Champaign in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Entomology, 1978.

[2] The system for naming head macrochaetae was proposed by Mari Mutt (1979b) and is detailed therein.

BOOK REVIEW

R. L. Blickle. 1979. *Hydroptilidae (Trichoptera) of America North of Mexico.* New Hampshire Agricultural Experiment Station, University of New Hampshire, Durham, New Hampshire. Station Bulletin 509.

Included in this bulletin are 180 species in 15 genera of the family known to occur in the United States and Canada. This is an increase of 102 species and 3 genera since Ross' 1944 *The Caddis Flies or Trichoptera of Illinois.* This is the first single publication in 35 years in which all recognized genera and species to 1977 are presented. An excellent key to genera and to species in each genus is given. A checklist of alphabetically arranged species in each genus is included with known distributional records by state and/or provinces. For those confused by the United States and Canada postal abbreviations of provinces and states an explanatory list of all such abbreviations is included. The bulletin is well illustrated with 183 original or redrawn published figures. Selected literature references are arranged as follows: "Literature," "Scent Organs," "Hydroptilidae Records," "Larval Literature." Dr. Blickles' excellent publication brings together figures, descriptions and records of the family currently scattered in several dozen publications. It is indispensible to present and future workers on the group. It would be difficult for any Trichopterist to have any adverse criticisms. Dr. Robert Blickle is to be congratulated on a publication long needed and well done. There is a need for such compilations of the remaining families in the order.

D. G. Denning